2 Marine Operations

Marine operations constitute a set of services provided by ports to facilitate smooth movement of vessels between anchorage points and berths as described below:

Load-line of a ship indicating the draft

- The ports should ensure that the access channels to the dock systems and berths are maintained at their reported depths so that the movement of vessels visiting the ports is not restricted due to unavailability of adequate draft[5].

- The visiting vessels should be guided through these channels by pilots to ensure safe navigability. As per the provisions of the Indian Port Act 1908, all visiting vessels of more than 200 GRT[6] are required to engage the services of pilots available at the ports.


Tugs placing a vessel at berth at Tuticorin port

It is also imperative that tugs should be engaged for proper placement of vessels at the time of berthing/de-berthing, shifting, turning, and movement through narrow channels. Delays in provision of pilotage services and tugs add to pre-berthing detention (PBD)[7] and increased turn-round time (TRT)[8]. Detention of vessels affects shipping schedules and inventories of shippers. It also results in higher vessel hiring charges for cargo operators, which are added to the prices of cargo at the destination.

- Ports should ensure that adequate navigational aids like buoys[9], signals and communication systems for night navigation are made available for accessibility round the clock and ensure smooth allotment of berths for cargo handling.

Audit examined the issues affecting efficiency and effectiveness in respect of marine operations at major ports. The findings are discussed in the succeeding paragraphs:

[5]Depth necessary to submerge a ship to her load-line. It determines the minimum depth of water required for safe navigation.

[6]Gross Registered Tonnage: All cargo vessels other than small barges meet this criteria

[7]Time for which a ship waits before getting entry into a berth.

[8]Total time spent by a ship since its entry till its departure. i.e the time taken by a vessel moving from anchorage to berth and returning to anchorage after completing cargo handling operations.

[9]Floating devices used as sea marks to aid pilotage by marking maritime access channels.

2.1 Adequacy of Draft

The average size of vessels plying on international routes registered an increasing trend from 68000 – 92000 DWT[10] in 2003-04 to 76000 – 108000 DWT in 2007-08.

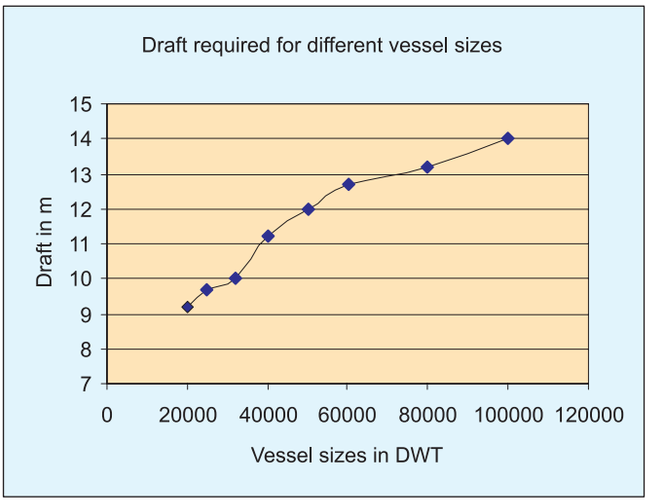

Fig 2.1

NMDP envisaged a draft of 13 to 14 metres or more for accommodating such types of vessels (See Fig 2.1). An Inter-Ministerial Group (IMG) constituted (March 2006) under the Committee on Infrastructure[11] recommended achieving a 14 metre draft at all ports by December 2008. Further, NMDP also envisioned that deep drafts were necessary at the ports to compete with other international ports in the region. At the ports of Colombo and Singapore, which acted as the primary trans-shipment[12] ports for cargo originating at or destined for India, draft of 14-16 metres was being maintained, thereby allowing all classes of ships to enter them. It was, therefore, imperative that the access channels and harbours of the nation's major ports should be made deep enough to handle all classes of vessels.

2.1.1 Draft unavailable for vessels plying international routes

Audit observed that out of the 11 ports, access channels at only three ports, viz. Chennai, New Mangalore and Vishakhapatnam (outer harbour) had the requisite draft to cater to vessels of current sizes. Most of the ports had multiple access channels. Kolkata Port comprised two dock systems, viz the Kolkata Dock System (KDS) and the Haldia Dock Complex (HDC) both having different access channels. Cochin port had three access channels viz Mattanchery channel (MC), an outer channel (OC) and the Ernakulam channel (EC). JNPT had a common channel (CC) with

[10]Dead weight tonnage - the carrying capacity of a ship (stores, fuel and cargo), expressed in tonnes.

[11]The Committee on Infrastructure, under the Chairmanship of the Prime Minister, was constituted on 31st August 2004 with the objective of initiating policies that would ensure time-bound creation of world class infrastructure delivering services matching international standards, developing structures that would maximize the role of public-private partnership (PPPs) and monitoring progress of key infrastructure projects to ensure that established targets were realized.

[12]Shipment of goods to an intermediate destination and then from there to another destination. The main revenue at the ports of Colombo, Singapore and Dubai comes from trans-shipment where cargo is transferred from feeder vessels to large ocean-going vessels.

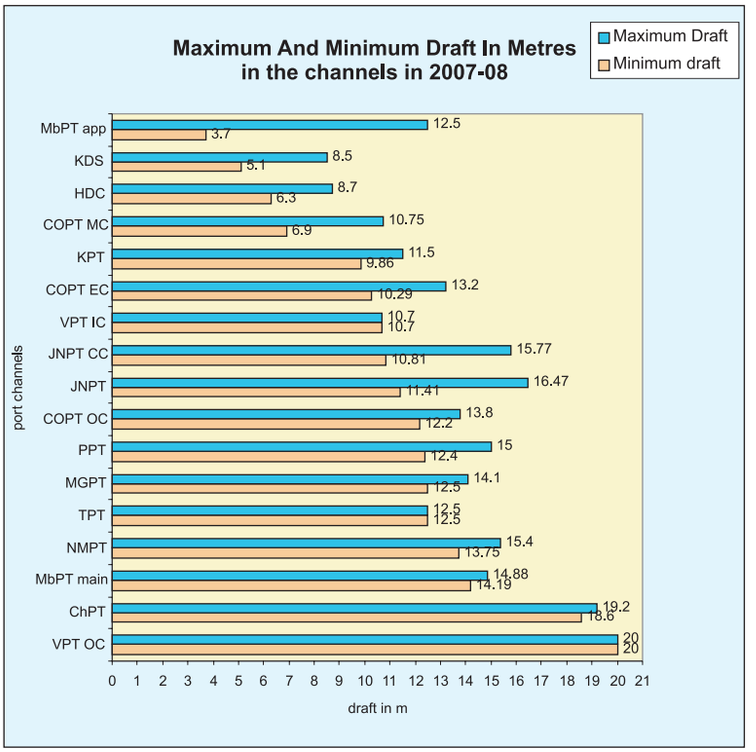

Fig 2.2

Mumbai port, apart from its own. Mumbai port had an access channel in addition to its own main channel. Vishakapatnam had an outer channel for the berths in the outer harbour followed by an inner channel for the berths in the inner harbour. The maximum and minimum drafts available at the channels providing access to the ports were as described in Fig 2.2.

In the eight other ports including JNPT, India's biggest container port, access remained largely restricted to vessels of smaller size that were less than 60000 DWT, due to lack of adequate draft. Vessels requiring higher draft could only access ports after performing lighterage[13] or uptopping[14] operations outside the harbour. The extent of such operations on visiting vessels in 2007-08 ranged from 2.5 *per cent* at Kandla to about 21 *per cent* at Haldia. Lighterage and uptopping contributed to high TRTs[15] of vessels.

The Ministry, in its reply, stated (August 2009) that greater efforts would be required to maintain drafts of 14 metres at ports as recommended by IMG. Capital dredging projects had been taken up in seven ports during 2007-10, viz. Cochin, Haldia, JNPT, Kandla, Mumbai, New

[13]Partial unloading of a vessel outside the harbour to reduce its draft, enabling access to berths.

[14]Loading of remainder cargo on to a vessel to its capacity, outside the harbour.

[15]Data on TRTs: Port-wise TRTs are shown in the chapter on performance benchmarks.

Mangalore, and Paradip. Although deepening schemes in these ports were envisioned under NMDP for completion by March 2009, it was noticed that except for one scheme of deepening in New Mangalore port, all the remaining schemes were significantly delayed and still to be completed (March 2009).

2.1.2 Reported depths did not provide adequate assurance to vessels

Reliability of draft is important so that ship operators can maintain voyage schedules and shippers can effectively manage their inventories. Audit scrutiny of vessel visits during 2007-08 revealed that only a minor share of vessels were of sizes compatible with the maximum drafts reported by each of the ports. The following table (2.1) shows significant variations between the reported[16] and the actual utilized drafts across all major ports including the three that had declared drafts deep enough to cater to vessels of current sizes.

Maximum drafts reported by ports and highest draft vessels that berthed in 2007-08

Port	No of vessels in 2007-08	Reported draft (max) in metres	Highest draft vessel (draft in metres)	Percentage of vessels within one metre of the highest draft vessel
Chennai	2053	19.2	17	2
Cochin	1171	13.8	12.5	7.6
JNPT	2712	16.47	12.6	4
Kolkata	1040	8.5	8.2	26
Haldia	2343	8.7	8.7	11
Mumbai	6150	14.88	14.6	3
New Mangalore	1166	15.4	14	14
Paradip	1655	15	12.5	4
Tuticorin	1602	12.5	10.9	1
Vishakhapatnam (Outer Harbour)	2346	20	17	2.7
Vishakhapatnam (Inner Harbour)		11.8	10.8	18

Table 2.1

In the case of Cochin, out of 142 vessels which visited the port during the sample months of July and December 2007, only 24 had drafts above 10.5 metres. Reported drafts, therefore, did not provide adequate assurance to vessels calling at the major ports. Port users in Mumbai and Tuticorin stated (December 2008) that the actual drafts were much less than those reported by those ports. Even at New Mangalore, where the proportion of visits of high draft vessels vis-à-vis

[16]Draft availability is reported or declared to shipping agencies periodically by the ports through tide and draft tables.

the reported drafts were highest (about 14 *per cent*), the actual draft available during four months was found to be below the minimum draft (13.75 m), declared during 2007-08. This restricted the cargo load of crude oil tankers visiting the port.

2.1.3 Draft variations between channels and berths leaving limited berthing options

Audit observed that in five out of the 11 ports, viz. Chennai, Cochin, Kandla, Tuticorin and Visakhapatnam, there were significant mismatches between the drafts available at the berths and the channels. As a result, the drafts at the approach channels in these ports remained underutilized. The position in Chennai is illustrated in Fig 2.3.

The problem was further compounded by the prevalence of high draft variability among the berths within these ports that left shipping lines with limited berthing options.

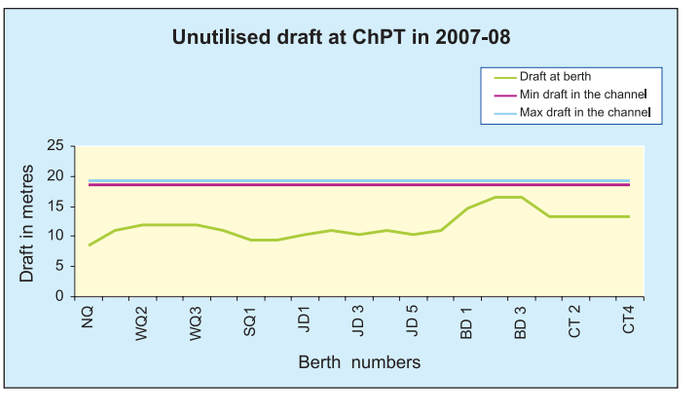

Fig 2.3

This resulted in the ships queuing up for a few berths leading to increased PBD and TRT of vessels. These problems were also pointed out by the port users in Chennai and Visakhapatnam. In the other six ports, the problem was not found to be significant. The user surveys conducted by Audit also indicated that draft reliability and timeliness of pilotage coupled with towage, navigational aids, etc were the major problems faced by the users of the major ports.

Thus, the issue of maintaining proper navigable drafts across major ports had not been addressed effectively. Inadequacy of draft had been one of the biggest limitations on efficient performance and development of trans-shipment volumes. Due to draft restrictions and wide variability, the major ports had been frequented by feeder vessels[17] up to the size of 12.5m. The restrictions imposed additional costs for vessels in terms of extra handling on trans-shipment or lighterage, additional trips or longer TRTs. With emerging competition from deep draft non- major ports in India, the share of these ports in the volume of Indian maritime cargo handled, may continue to decline.

[17] Large ocean going vessels known as mother vessels cannot enter all ports and visit only the bigger ports called hub ports. Cargo is shipped from these mother vessels to smaller ports in the vicinity in smaller vessels called feeder vessels.

The Ministry accepted the observation and stated (August 2009) that the draft variations were mainly due to siltation by natural causes and improper maintenance dredging. It stated that suitable plans needed to be drawn up by the ports to address the variability of drafts between the channel and berths, to signal certainty of drafts and to provide larger berthing options.

2.2 Survey and Dredging

As all major ports except Tuticorin port, which had a rocky seabed, were prone to siltation in different degrees, maintenance of appropriate navigable drafts posed a key business challenge to them. These ports were expected to maintain designed drafts by assessing dredging requirements through depth surveys and undertaking dredging work. Dredging is primarily of two types viz. maintenance dredging, which is a regular activity that ensures that channels and berths are maintained at the reported depth and capital dredging, which involves channel deepening and widening to accommodate larger vessels, with the aim of achieving larger economies of scale.

2.2.1 Non-standardization of survey affecting dredging assessments

For proper draft maintenance, depth surveys were being conducted in-house at most major ports (excepting Cochin, JNPT and Mormugao) for assessing dredging requirements. It was noticed in audit that although the echo sounding[18] method was in use, the survey process was not standardized across the ports. Frequency of surveys ranged from twice in a week at Paradip to once in two to five years at Tuticorin. At Vishakhapatnam no survey had been conducted for two and a half years. Further, it was noticed in audit that in two out of the 11 ports, viz. New Mangalore and Mumbai, the dredging volumes awarded in the contracts were not based on survey assessments. At New Mangalore, the dredging volumes were estimated on the basis of previously executed quantities in spite of regular surveys. In the case of Mumbai, the differences between the survey estimates and the quantities in the dredging contracts differed by as much as 29 *per cent* during 2004-05.

[18]Procedure for measuring depth by emitting sounds from the water surface to the bottom and measuring the time taken in receiving the echoes.

2.2.2 Inadequate management of maintenance dredging

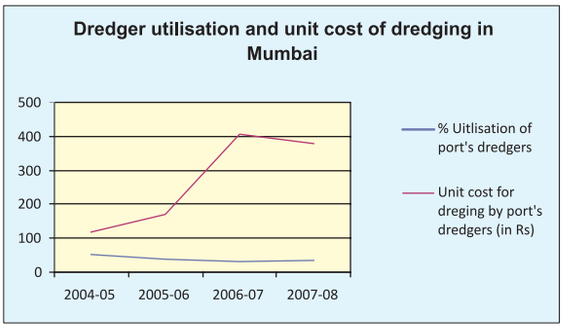

Fig 2.4

For carrying out maintenance dredging, all the ports except Mormugao had their own dredgers. It was observed in audit that the dredgers owned by the ports remained grossly underutilized.

As the overhead expenditure on such dredgers remained almost fixed, their low utilization resulted in high cost of dredging per unit volume dredged by port-owned dredgers. (See example of Mumbai in Fig 2.4). This statistic was then used by the ports to justify hiring of dredgers at lower unit costs. For example, at Cochin, the port's dredger was engaged for 235 days in 2005-06. It dredged 1.099 mcum[19] at a unit cost of Rs 62 per cum at 65 *per cent* utilization. In the subsequent year, the dredger was engaged for only 160 days to dredge 0.639 mcum. Both the percentage utilization and quantity dredged dropped sharply and the unit rate of dredging shot up to Rs 108 per cum. The port, while justifying the underutilisation of the dredger, stated (May 2009) that the dredger, being very old, was utilised after observing the norms of routine lay-offs during holidays and for annual surveys. In Chennai port also, hiring of dredgers was done and the port's own dredgers remained underutilised.

It was noticed that all ports, except Tuticorin, which has a rocky seabed, resorted to hiring of dredgers for carrying out maintenance dredging. Although, the Major ports were having the options to hire parties for dredging by inviting open competitive bids, the Dredging Corporation of India (DCI), a public sector undertaking was, however, having an edge over others as the Government reserved the right to assign any dredging contract to it in public interest. At Kolkata port, which required intensive dredging throughout the year and which was mandated by the Ministry to engage DCI alone, the required draft could not be maintained in 2007-08 in spite of the contract having a 'guaranteed depth'[20] clause. Due to falls in the draft, even smaller vessels could not comfortably access the port during February 2008. The navigability at Haldia also emerged as a serious cause of concern in 2008 and the port had to resort to emergency measures. In reply, the Kolkata port stated (June 2009) that due to DCI's inability to provide adequate numbers of dredgers, as per the contractual obligation, during the last few years, the depth at the governing bars[21] in the channel had fallen.

[19] million cubic metres

[20] A clause in a dredging contract which binds the agency to guarantee the achievement of an agreed depth, failing which the agency can be penalized.

[21] Raised portions of land in the river bed. Some of the bars along the main channel determine the effective draft that can be availed of. These are called governing bars.

As seen from Figure 2.5, the rates for maintenance dredging varied amongst the ports.

It was also noticed that DCI's rates varied widely from port to port. Further, the dredging contract agreements were not standardized and in general, failed to incentivise the achievement of the required depths. In the case of daily-rated contracts[22], none of the ports had conditions to take into account the speed of the dredgers, hopper leakages[23] etc. Such conditions were included in unit rate contracts only at New Mangalore and Mormugao. Density based restrictions for unit rated contracts were included only at Paradip and Chennai. The minimum daily targets were also different for the ports. In the case of New Mangalore, the minimum daily target was 85000 cum against 21000 cum at Paradip.

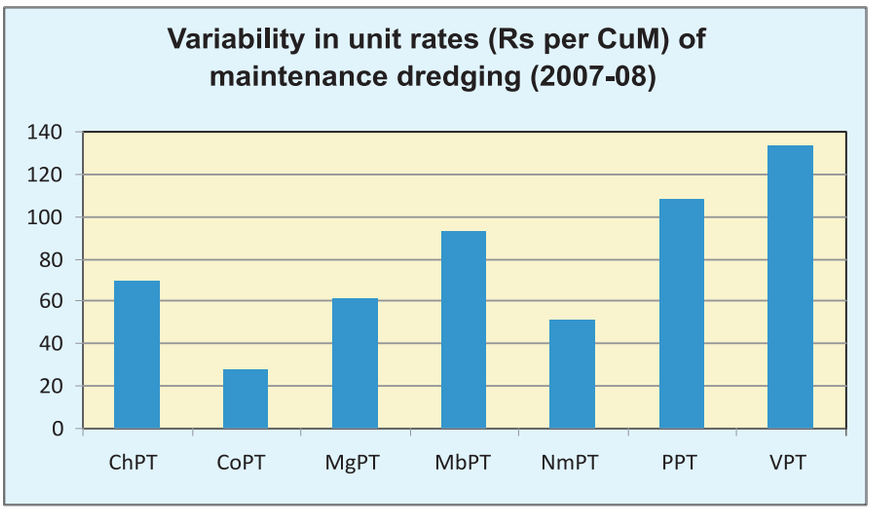

Fig 2.5

The above observations indicate that the issue of maintenance dredging had not been addressed effectively by the ports. Further, the policy of the Government of India restrained the ports from exploring other options or engaging firms of international repute for maintaining the channel. The Ministry stated (June 2009) during the exit conference, that DCI itself was facing capacity constraints and that the ports were being encouraged to explore other options, including global bidding. The Ministry stated (August 2009) in its reply, that improper maintenance dredging was adding to the siltation problem and dredging projects were also being delayed due to non-availability of bigger dredgers and quality services. This buttresses the need for a more open dredging policy to explore best resources worldwide.

[22]The dredging contracts were primarily of three types: unit rated, daily-rated and daily-rated with depth-guaranteed clauses.

[23]Compartments in a dredger for storing dredged material. In cases where the hoppers leak, the dredged material falls back into the channel, reducing the effectiveness of dredging.

Dredging contracts: A case study

- At Cochin Port Trust, nearly 30 *per cent* of the port's revenue excluding estate rental revenues was consumed on dredging. The share of dredging volume by the port's own dredgers was only five *per cent* at a capacity utilization of 50 *per cent* during 2003-08. The bulk of the dredging work was done through the engagement of private contractors.

- The port awarded maintenance dredging work to M/s Jaisu Shipping Co.Pvt.Ltd during the year 2007-08. As per the agreement, if the contractor failed to maintain the channels to the required width and depth, recovery was to be made at defined rates up to a maximum of four *per cent* for a shortfall of 0.9m to 1.2m below the target depth. Such low rates of penalty did not incentivise performance. Further, the penalty clause was also changed to favour the contractor. For example, in 2005-06, the penalty for non-achievement of the target was reduced by half as compared to the preceding year, without reasons. The leftover volumes of a year were carried forward to the dredging estimate for the next year, thereby inflating the value of the contract. Data on the size of vessels visiting during the last five years also indicated that the reported channel draft was underutilized and only three *per cent* of the vessels corresponded to draft of 11-12m. In reply, the port stated (May 2009) that to minimize the maintenance cost, the contract specified acceptance of a ruling shortfall upto 1.2 m at all locations and the contractor's failure to keep specified depths could not be construed as a violation of the contract. If the depths available were below the required draft, localized dredging together with the tidal window[24] was used to navigate the vessels having draft upto 12.5 m. The reply is not acceptable as it was the responsibility of the port to ensure the availability of the required draft. Resorting to localized dredging along with the tidal window to make up the shortfall in the required draft cannot be accepted as a standard practice. Besides, the clause regarding acceptance of 1.2 m shortfall failed to incentivise target achievement.

- Audit observed that the cost of annual maintenance dredging ranged from Rs 24.54 crore to Rs 30.90 crore during the period 2003-04 to 2006-07, which increased to Rs. 46.58 crore during 2007-08. It was noticed that the tendered cost during 2007-08 was exorbitant due to the high estimated cost of Rs. 40 crore which was based on budgetary offers from various dredging firms. As this was not a new work, the port should have worked out the estimated cost, taking into consideration the previous year's expenditure on the work and technical aspects during the ensuing year. The procedure adopted by the port resulted in unjustified estimated costs during 2007-08. This led to the abnormal increase in the contract price.

[24]The time period when higher draft is available due to high tide conditions.

In reply, the Management stated (May 2009) that as a claim from DCI for extra payment for the additional quantity dredged during 2006-07 was still pending and the completion cost was not available, it was not prudent to consider the contract with DCI as the base for the dredging estimate for 2007-08. The estimate was thus prepared on the basis of budgetary offers of DCI. The reply is not acceptable due the fact that the estimates should have been prepared considering the previous year's expenditure as the work was not new and could not have increased abnormally in the next year.

2.2.3 Few schemes for capital dredging

Although NMDP placed emphasis on capital dredging projects, it was found that only 15 such projects had been planned and no major project had been completed as of date. It was also noticed that the funds earmarked for capital dredging of 7 mcum at seven ports was Rs 137 crore as compared to the expenditure of Rs. 272 crore incurred on maintenance dredging of 2.7 mcum during the last 10 years.

Despite a global tender called in 2007 for a major deepening scheme at JNPT, the tender could not be finalized as the Ministry did not approve the award of the work because the lowest quotation received was above the estimated value of Rs 800 crore.

At Kolkata and Haldia which had long access channels prone to 'shoaling'[25] at particular stretches, a scheme for comprehensive river regulatory measures had not been approved by the Ministry even after 20 years of the initial proposal. The scheme, with an estimated cost of Rs 385 crore, was also included in the first phase (2005-2009) of NMDP. However, it was not taken up and the Kolkata port engaged (2009) Central Water and Power Research and Consultancy Services, (CWPRS), Pune for revalidation of the scheme under directions of the Ministry.

Recommendations

- *Concerted efforts should be made by the Ministry to ensure the minimum draft availability of 14 metres as recommended by the Inter-Ministerial Group. Assessment of dredging requirements should be made based on long-term planning and proper surveys with the help of specialized organizations like National Institute of Ocean Technology and Central Water and Power Research and Consultancy Services.*
- *The draft plan of each port, particularly those of Chennai, Cochin and Visakhapatnam should focus on addressing the significant mismatches of draft between approach channels and berths.*
- *As the present dredging policy of the Ministry compelled some ports to engage DCI in spite of the latter failing to meet targets, a clear cut policy ensuring competitive bidding should be formulated.*

[25] Gradual formation of sandbanks, thereby creating shallow water which is hazardous for ships.

2.3 Pilotage

According to the Indian Port Act, 1908 all vessels bigger than 200 Gross Registered Tonnage (GRT)[26] calling at a port have to compulsorily engage pilotage services. The optimum inventory of pilots, pilot vessels and tugs depends on the specific operating conditions at each port where issues like length of the access channel, extent of navigational hazards and the number of vessels handled during a certain period have to be factored into the calculation.

It was observed that the resources available at the ports were partly owned and partly hired, with Chennai, Kolkata, and Mumbai using lesser hired resources than JNPT, Mormugao and Tuticorin.

2.3.1 Promptness in providing pilotage

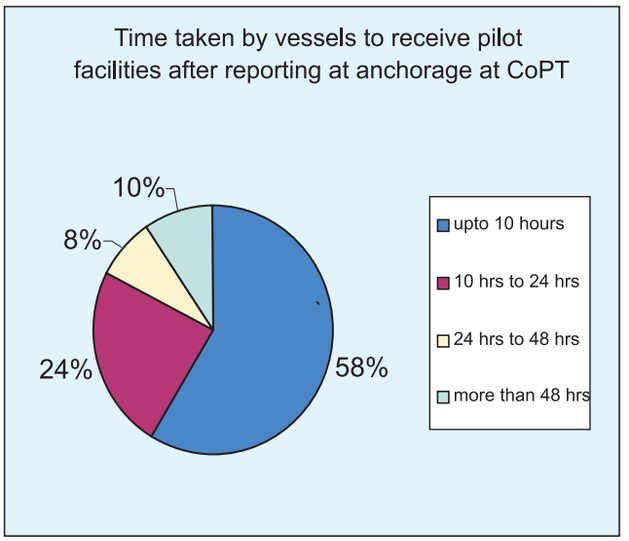

Fig 2.6

To avoid high detention of vessels, it is imperative that ports ensure that pilotage services are provided promptly for them. It was seen that the minimum time for providing pilotage varied from port to port depending on channel length, location of pilot station, etc. Any delay in providing pilotage at a port would be taken as the time taken for vessels to receive pilot facilities over and above the minimum time. In this regard, Audit observed the following:

- In four out of the 11 ports, viz. Chennai, Cochin, Kandla, and New Mangalore, there were significant delays in providing pilotage.
- At both New Mangalore and Cochin, against the minimum time of 10 and 40 minutes respectively, about 20 *per cent* and 18 *per cent* of the vessels received the facility after 24 hours. (See Fig 2.6 for Cochin as an example)
- At Chennai, against a minimum time of 2 hours and 23 minutes, about 40 *per cent* of the vessels received pilotage after 50 hours of arrival during July and December 2007.

[26]Weight of an empty vessel. The weight of 100 cubic feet of enclosed space in a ship is one vessel tonne.

At Kandla, against 45 minutes of minimum pilotage time, delays in providing pilot facilities were upto 10 days for the months of July and December 2007. A user survey at Kandla indicated that the availability of pilots was inadequate. At Haldia, although the port had a large inventory of pilotage facilities, detention of ships were reported due to unavailability of pilots.

The Ministry accepted (August 2009) the shortage of pilots in all the ports and stated that almost two-thirds of the pilots working in the ports were on contractual basis.

Good practices in India:

At **Visakhapatnam**, sample check in audit showed that the services were fairly prompt. Pilotage at VPT was provided between 15 minutes and three hours of the vessels calling at anchorage.This was being achieved despite the fact that the port had an old fleet of pilot vessels with nine pilots servicing 21 vessels per month on an average.

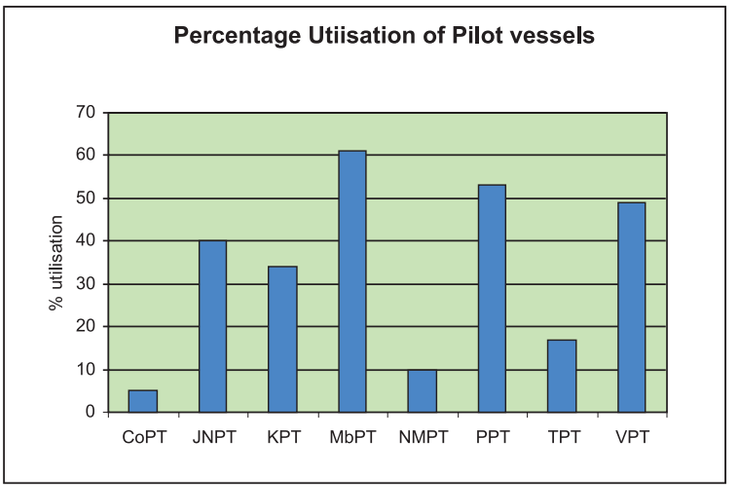

Fig 2.7

2.3.2 Low utilization and high maintenance cost incurred on old pilot vessels

The average age of the pilot vessel fleets (three to six in each port) was more than 10 years in all ports except Kandla and Paradip. Their utilization was found to be less than 50 *per cent* except in respect of Mumbai and Paradip as shown in Fig 2.7.

It was also noticed that the expenditure on maintenance of the vessel fleets increased sharply in the case of older vessels as shown in Fig 2.8. In three out of the 11 ports, viz. Mormugao, Mumbai and JNPT, where the average age of the vessels was above 15 years, the average maintenance expenditure per vessel ranged from Rs 48.50 lakh at JNPT to Rs 58.17 lakh at Mumbai.

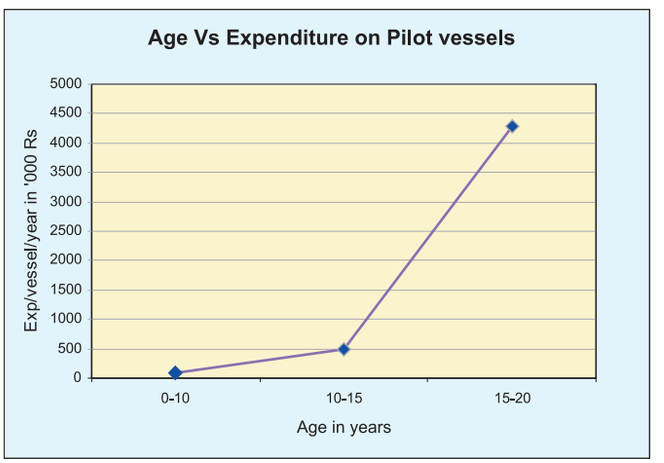

Fig 2.8

2.4 Night Navigation

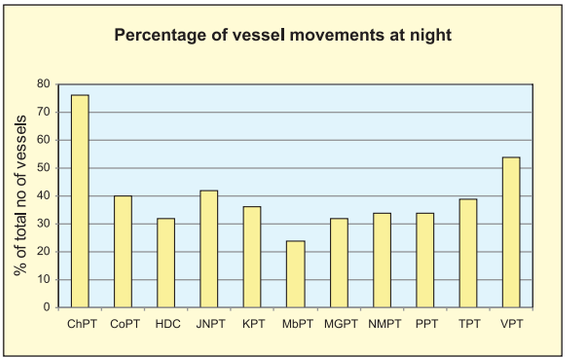

Fig 2.9

For ensuring smooth access to berths round the clock, the ports should provide proper facilities for night navigation like lights, lighted buoys, signals, pilots etc. It was observed that the proportion of vessel movements at night varied from port to port, being high in Chennai and Visakhapatnam and low in every other port as shown in Fig 2.9.

Facilities were found to be lacking particularly in Cochin, Kandla, Kolkata, Mumbai and Tuticorin. At Cochin, users stated that night navigation facility was not available in Matancherry wharf due to poor lighting of channels. In Kolkata, night navigation through the Kolkata channel in the upper reach (for about 42 miles) was not available due to the absence of proper lighting arrangements. At Kandla, there were restrictions on night navigation for vessels having draft of more than 10.2 m and LOA[27] of more than 200 metres. Kandla port suspended night navigation from December 2008 due to shortage of pilots. Users of Mumbai and Tuticorin ports pointed out (December 2008/January 2009) considerable delays in getting facilities (pilot, tugs etc.) at night. At Mumbai, the deployment of supervisory staff during the third shift[28] was less than the first shift. Users also pointed out that at JNPT, vessels up to LOA of 270m were permitted and 42 *per cent* of vessel movements took place at night. However, due to the restricted availability of facilities, there were PBDs of larger size vessels (having LOA beyond 270metres) arriving at the calling points at night.

2.5 Lock Gate Systems

Among the ports, lock gate systems[29] for entry into the harbours were in use only in Mumbai and Kolkata Port.

[27]Linear measurement of a vessel indicating the maximum length of a ship.

[28]Daily work at ports is done in three eight-hour shifts. The night shift (10pm-6am) is referred to as the third shift.

[29]At impounded dock systems, a certain depth is maintained by restricting tidal variations and shoaling outside the harbor by means of multiple lock gates. Vessels can only access the harbour after passing through a narrow lock entrance channel when the gates are operated.

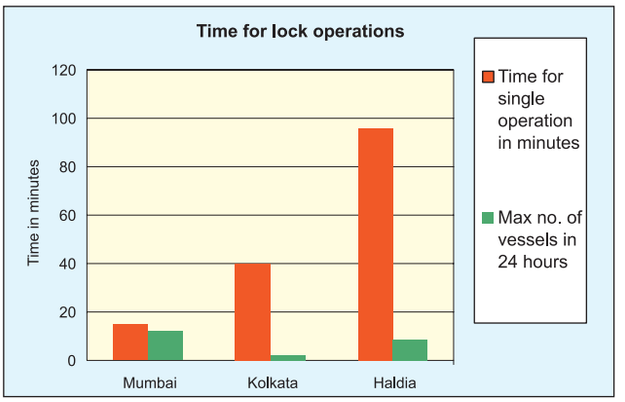

Fig 2.10

It was observed that inefficient operation of old lock gates at Kolkata Port both at KDS and HDC led to detention of vessels.

The average time taken to operate the lock gate system was highest at Haldia (96 minutes) whereas in Mumbai[30] it was minimum (15 minutes) as shown in Fig 2.10. This restricted the number of vessels that could enter or leave the port to eight per day. This resulted in high PBD (2.86 days) and TRT (4.26 days). To overcome this restriction, a second lock entrance had been planned under NMDP Phase–II, to be implemented during the period 2007-12.

2.6 Berthing

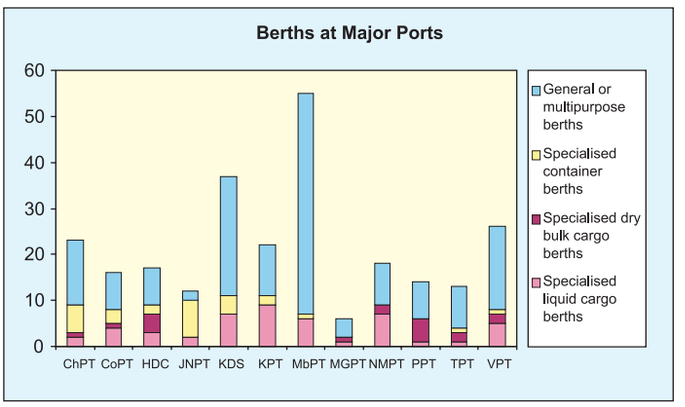

Fig 2.11

Berth allotment constitutes an integral part of marine services. When vessels call at anchorage, the marine department of each port allots berths for cargo handling operations.

The allotments are primarily dependent upon the availability of vacant berths, equipment support available in them and the type of cargo to

[30]Lock gates are in use at Indira Dock, Victoria Dock and Princess Docks at Mumbai.

be handled. With increased specialisation of the type of cargo, vessels prefer berths that have specialised cargo handling equipment, thereby facilitating efficient handling. Berths at major ports consist of specialised berths for handling liquid bulk, dry bulk and containerised cargo apart from general purpose berths (Fig 2.11). It was found that 50 *per cent* of the berths at all the ports except JNPT and Haldia belonged to the general category.

It was noticed that although the cargo mix at major ports showed that liquid bulk, dry bulk and containers were the three main types of cargo handled at the ports, the low proportion of specialised cargo berths resulted in queuing up of ships for such berths and consequent PBD.

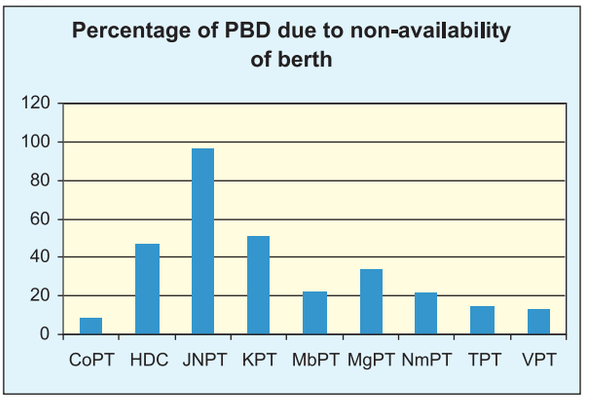

Fig 2.12

It was observed that a significant proportion of PBD was attributable to non-availability of berths as shown in Figure 2.12. It was also noticed that the PBD on all other factors attributable to the ports (port account) was not being identified and addressed by the ports.

At Visakhapatnam, the PBD for want of berths in 2007-08 was 8348 hours, amounting to 13.47 *per cent* of total PBD at the port in that year. It was found that vessels were detained at anchorage as the two preferred berths at the outer harbour (one being privately operated with better equipment support and the other being the only multi-cargo berth) were occupied.

Total PBD reported at major ports during July and Dec 2007	
PORT	Total PBD (in days)
CoPT	77
HDC	1247
JNPT	325
KPT	988
MbPT	262
MGPT	7
NMPT	113
TPT	401
VPT	563
Total	3983

Table 2.2

At Mumbai, it was found that more than one-third of the total ships which needed berthing at the chemical berth at New Pir Pau were detained for more than 24 hours due to non-availability of the berths.

Although a proposal for constructing a second chemical berth to reduce congestion was approved way back in 2002 and was also included in NMDP, it had not been implemented as of date.

The total PBD during the two sample months of 2007 was 3983 days (as shown in Table 2.2). This resulted in an additional cost burden on trade of more than Rs 1400 crore per annum.

Recommendations

- Proper efforts should be made to improve night navigation facilities in Cochin, Kandla, Kolkata, and Tuticorin.
- Factors leading to pre-berthing detentions on port account should be identified and addressed by the ports.